

THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY

Published by the Wilson Ornithological Society

VOL. 96, No. 1

MARCH 1984

PAGES 1-160

Wilson Bull., 96(1), 1984, pp. 1-5

OBSERVATIONS OF THE NESTING BIOLOGY OF THE GUIANA CRESTED EAGLE (*MORPHNUS GUIANENSIS*)

RICHARD O. BIERREGAARD, JR.

The natural history of the Guiana Crested Eagle (*Morphnus guianensis*) is poorly known (Wetmore 1965). Most information currently available is based on casual observations; for examples see Wetmore (1965) or Lehmann (1943). Here I present the first detailed observations of the nesting of one of the largest forest dwelling raptors in the Americas.

Morphnus guianensis occurs from Honduras to northern Paraguay and Argentina, where it is restricted to lowland tropical forests (Brown and Amadon 1968). Lehmann (1943) reports that it is encountered exclusively in the wettest, warmest areas of dense forest along the coast or at river edges.

Discovery of the nest.—On 6 March 1980 a male *M. guianensis* was spotted moving through the canopy and subsequently followed to a nest. The nest was about 28 m above the ground in the first fork of a large Lecythidaceae (common name = jararana). The tree was not an emergent, but due to the local terrain, afforded a view of about 70 m of the canopy east of the nest. The nest was located in virgin forest 80 km north of Manaus, Brasil (2°25'S × 59°50'W), approximately 20 km from the Río Urubu, the closest river. Soils in the region are predominantly nutrient-poor yellow, allic latosols of high clay content on which the forest canopy reaches about 37 m. Emergents can be as tall as 45 m. The canopy is fairly regular in contour and closed, letting little light onto the forest floor. The understory is fairly open, typically with many stemless palms. The terrain has significant microrelief due to the many streams that intersect the forest. Annual rainfall over the last 30 years in nearby Manaus has averaged 2186 mm, falling mostly during December through April (Anonymous 1978).

Observations at the nest: pre-egg-laying.—A vocalization heard at the

time of discovery, from either the male or female, was a shrill, high pitched whistle, reminiscent of a bosun's whistle, *youuu-ree*, the final note short and ascending.

At dawn (06:00) on 7 March, the light-phase male landed in the nest and copulated with the female, an extreme dark-phase bird, which had been in the nest in an incubating posture. Copulation was brief (shorter than 10 sec) after which the male hopped from perch to perch near the nest, aware of my presence but, judging by his relaxed posture and the lack of attention paid to an observer directly beneath him, apparently unperturbed. His call during this time was a single high-pitched whistle.

The differences between the birds made it apparent why the relatively rare (Wetmore 1965, Blake 1977) dark phase was once considered a separate species, *M. taeniatus* Gurney (1879) (see Frontispiece). The female, with a slate black head, neck, and upper chest, and heavy black barring on the lower chest and underwings, was strikingly different from the pale male, with white ventral plumage finely barred with orange brown below the pale grey head, neck, and breast. The grey scalloping on the male's upperwing coverts in contrast to the female's solid dark upper surface, without the white and grey tips to the wing coverts mentioned by Wetmore (1965), further accentuated the difference between the pair.

Eggs, and incubating behavior.—On 10 April I climbed a tree adjacent to the nest tree and found two large creamy-colored eggs in the nest depression. Brown and Amadon (1968) refer to one set of eggs, purportedly of this species, which were cream-colored with large pale yellow-brown spots at the broad end and finer spots over the rest of the surface. The female, who remained within about 20 m of the nest, was not aggressive as I climbed above the nest about 5 m from the nest tree. During my descent, she returned to the nest. This docile behavior is similar to that reported by Rettig (1978) for a pair of Harpy Eagles (*Harpia harpyja*) in similar circumstances in Surinam. I never climbed the nest tree.

Young in the nest.—On 1 May I began to construct a nest-level blind in a tree 10 m from the nest. At this time, only one young was evident and appeared to be no more than a few days old. Working 1 h or so a day, the blind was completed by 6 May at which time observations of the nest commenced.

From 6 May–8 June, 70 h were spent in the blind on 13 separate days. During the month of observation, the female was in almost constant attendance at the nest. Upon my arrival at the blind (usually at about 06:00) she would flush from the nest, but return quickly, often within a minute of my disappearing into the blind. When I descended from the blind, the female remained in the nest and watched as I disappeared into the vegetation below the blind and nest.

During the first 2 weeks of observation, the female spent most of her time in a brooding position, although not always actually on the young. During very sunny days she stood above the young with wings slightly extended to shade it, while on rainy days she assumed a brooding posture and pulled the young to her chest.

The female was meticulous about the nest. Almost every time she returned to the nest without food, she brought a fresh bough torn off the nest tree or one nearby. When she alighted in the nest, often with the bough in her beak, she pulled individual leaves off the bough and put them around the rim of the nest. The female was fastidious about intestines and stomachs of prey items which she carried from the nest in her beak immediately after feeding. At the conclusion of the study no prey remains were discovered beneath the nest.

During the first 3 weeks of observation, or until the young was about 4 weeks old, the male appeared to be the sole provider for the three birds, as the female never strayed from the nest for more than 30 min, and could usually be heard moving about in the canopy during this time. When delivering food, the male announced his arrival in the nest area with a repeated, single note high-pitched call to which the female responded with a two syllable loud and high pitched, shrill *wee hee*. When the female heard the male's approach call, she immediately mantled over any prey remaining in the nest, her extended wings pumping with each syllable of her answering call. When the male landed in the nest to deliver prey items the female quickly snatched the food from him and mantled over the newly delivered item, as Rettig (1978) reported for the Harpy Eagle. The male usually remained in the nest less than 1 min.

Nest failure.—On 14 June the nest was empty, with no sign of the young either in the nest or on the ground below. The young had appeared healthy on the previous visit and the female was present and delivering food to the nest. Possible explanations for the failure of the nest include the death of one or both of the adults, most likely at the hands of a hunter from a nearby ranch, or the loss of the young while the female was away from the nest to a predator such as a tayra (*Eira barbara*), a large arboreal mustelid occasionally seen moving through the canopy, or another large raptor.

Feeding behavior.—Including prey items present in the nest at the beginning of a day's observation, 15 items were seen. These include six snakes (one rainbow boa, [*Eunectes murinus*], three emerald tree boas, [*Corallus caninus*], and two unidentified snakes, one of which may well have been a rainbow boa), one unidentified frog, perhaps *Phylomedusa bicolor*, and eight mammals. The mammals were small; estimated from the usually headless prey items that the male delivered, total body length

was about 20–35 cm, excluding tails. I believe most were probably either cricetine or hystricomorph rodents or marsupials. Although squirrels (*Sciurus gilvicularis*) are the most conspicuous small to medium sized mammal in the area, none were observed as prey items in this nest. On the last day of observation, a kinkajou (*Potus flavus*) was delivered to the nest by one of the parents. At 10:10 the female left the nest and returned 30 min later with a second kinkajou.

Brown and Amadon (1968) list small monkeys, opossums, and reptiles as the principal prey types. The data from this nest show a preponderance of reptiles, particularly while the male was principal provider for the family. One observation of the female attacking a flock of Grey-winged Trumpeters (*Psophia crepitans*) passing near the nest suggest that birds are sometimes taken, although the foot structure and relative length of the toes are not typical of raptors that prey heavily on birds (Bierregaard 1978).

Concluding remarks.—As the observations reported here cover only a part of the breeding cycle, the dates for its initiation and completion can only be inferred. Assuming an incubation period of 40–50 days, laying probably took place between mid-February and mid-March, in the peak of the rainy season. Hatching occurred at the very beginning of the dry season. At the time of the last observation of the young, feathers were just appearing through the down on the back and upper wing coverts. The general appearance of the young on the last day it was observed (between 36 and 43 days after hatching) is very similar to that of the 54-day young Harpy Eagle pictured in the frontispiece of Rettig's (1978) study, in terms of the size relative to the parent and the feathers beginning to appear. The young harpy at the time was approximately 40% through the nestling phase. Had the young *Morphnus* survived and continued to develop at a similar rate, it would have fledged in the beginning of August, 90 days after hatching.

ACKNOWLEDGMENTS

This study was supported by the World Wildlife Fund-U.S., Instituto Nacional de Pesquisas da Amazonia, and a grant from the National Park Service, Cooperative Agreement CX-0001-9-0041 and represents publication no. 9 in the Minimum Critical Size of Ecosystems Project Technical Series.

LITERATURE CITED

- ANONYMOUS. 1980. Projeto Radambrasil 18:261.
BIERREGAARD, R. O., JR. 1978. Morphological analyses of community structure in birds of prey. Ph.D. diss., Univ. Pennsylvania, Philadelphia, Pennsylvania.
BLAKE, E. R. 1977. Manual of Neotropical birds. Univ. Chicago Press, Chicago, Illinois.

- BROWN, L. AND D. AMADON. 1968. Eagles, hawks and falcons of the world, McGraw-Hill Book Co., New York, New York.
- LEHMANN, F. C. 1943. El genero *Morphnus* [A review of the genus *Morphnus*]. *Caldasia* 2:165-179.
- RETTIG, N. L. 1978. Breeding behavior of the Harpy Eagle (*Harpia harpyja*). *Auk* 95:629-643.
- WETMORE, A. L. 1965. The birds of the Republic of Panama. *Smithson. Misc. Coll.* 150: 246-248.

WORLD WILDLIFE FUND—US, 1601 CONNECTICUT AVE., N.W., WASHINGTON, D.C. 20009. ACCEPTED 1 NOV. 1983.

COLOR PLATE

The Frontispiece of the dark phase Guiana Crested Eagle (*Morphus guianensis*) has been made possible by an endowment established by George Miksch Sutton (1898-1982).

STUDENT MEMBERSHIP AWARDS IN THE WILSON ORNITHOLOGICAL SOCIETY FOR 1984

Student Membership Awards in The Wilson Ornithological Society have been made available from the general funds of the Society to recognize students who have the potential to make significant contributions to ornithology. The following students have been selected by the Student Membership Committee for awards this year: Robin Elizabeth Abbey, College of William and Mary; A. Margaret Elowson-Hawley, Univ. Wisconsin; Todd Eric Fink, Southern Illinois Univ.; Elizabeth Jane Hawfield, Winthrop College; Geoffrey Edward Hill, Univ. New Mexico; D. Scott Hopkins, Western Illinois Univ.; Shonah Anne Hunter, Southern Illinois Univ.; Jerry Wayne Hupp, Colorado State Univ.; Emily Dale Kennedy, Rutgers Univ.; Monica Grant LeClerc, Brigham Young Univ.; Nancy Ann Lutfy, Northern Illinois Univ.; Michael Richard North, North Dakota State Univ.; Andrew Townsend Peterson, Miami Univ. (Ohio); Eleanor Marie Prindiville, North Dakota State Univ.; Mark DuValle Reynolds, Univ. California (Berkeley); Kathryn Daniels Robinson, Bowling Green State Univ.; Elizabeth Irene Rogers, Michigan State Univ.; Gregory John Transue, Rutgers Univ.

Student Membership Committee—Thomas C. Grubb
 Charles F. Leck
 Roland R. Roth
 John L. Zimmerman, *Chair*